

Patent Claims ~~amended (claim 56 has been deleted)~~

1. Chewing gum comprising at least one biodegradable polymer and chewing gum ingredients,

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said chewing gum ingredients being chosen from the groups of softeners, sweeteners, flavoring agents, active ingredients, fillers, mixtures thereof and

10 said chewing gum containing less than about 2.0 weight percent water of the chewing gum

2. Chewing gum according to claim 1, wherein said chewing gum containing from about 0.01 to about 2.0 weight percent water of the chewing gum

15 3. Chewing gum according to claim 1 or 2, wherein said chewing gum containing less than 1.0 weight percent water of the chewing gum

4. Chewing gum according to claim any of the claims 1-3, wherein said chewing gum containing less than 0.75 weight percent water of the chewing gum

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5. Chewing gum according to claim any of the claims 1-4, wherein said chewing gum containing less than 0.2 weight percent water of the chewing gum

6. Chewing gum according to claim any of the claims 1-5,
25 wherein the at least one biodegradable polymer is a polyester polymer obtained by the polymerization of one or more cyclic esters by ring-opening and where at least one of the cyclic esters are selected from the groups of glycolides, lactides, lactones, cyclic carbonates or mixtures thereof.

30 7. Chewing gum according to claim any of the claims 1-6,
wherein the at least one biodegradable polymer is a polyester copolymer obtained by the polymerization of two or more cyclic esters by ring-opening and where at least

one of the cyclic esters are selected from the groups of glycolides, lactides, lactones, cyclic carbonates or mixtures thereof.

8. Chewing gum according to claim any of the claims 1-7,
5 wherein the rheological properties of the degradable polymer is controlled by
adjusting the functional number of initiator.

9. Chewing gum according to claim any of the claims 1-8,
wherein the lactone monomers are chosen from the group of ϵ -caprolactone, δ -
10 valerolactone, γ -butyrolactone, and β -propiolactone. It also includes ϵ -
caprolactones, δ -valerolactones, γ -butyrolactones, or β -propiolactones that have been
substituted with one or more alkyl or aryl substituents at any non-carbonyl carbon
atoms along the ring, including compounds in which two substituents are contained
on the same carbon atom and mixtures thereof.

15 10. Chewing gum according to claim any of the claims 1-9,
wherein the carbonate monomer is selected from the group of trimethylene
carbonate, 5-alkyl-1,3-dioxan-2-one, 5,5-dialkyl-1,3-dioxan-2-one, or 5-alkyl-5-
alkyloxycarbonyl-1,3-dioxan-2-one, ethylene carbonate, 3-ethyl-3-hydroxymethyl,
20 propylene carbonate, trimethylolpropane monocarbonate, 4, 6dimethyl-1, 3-
propylene carbonate, 2, 2-dimethyl trimethylene carbonate, and 1, 3-dioxepan-2-one
and mixtures thereof.

11. Chewing gum according to claim any of the claims 1-10,
25 wherein the chewing gum is substantially free of water containing sweeteners or
softeners.

12. Chewing gum according to claim any of the claims 1-11,
wherein the chewing gum comprises at least one low hygroscopic softener or
30 sweetener.

13. Chewing gum according to claim any of the claims 1-12,

wherein the at least one low hygroscopic softeners or chewing gum comprises powdered erythritol.

14. Chewing gum according to any of claims 1- 13, wherein
5 said chewing gum ingredients comprise flavoring agents.

15. Chewing gum according to any of claims 1- 14, wherein
said flavoring agents comprises natural and synthetic flavorings in the form of
natural vegetable components, essential oils, essences, extracts, powders, including
10 acids and other substances capable of affecting the taste profile

16. Chewing gum according to any of claims 1-15, wherein
said chewing gum comprises flavor in an amount of 0.01 to about 30 wt %, said
percentage being based on the total weight of the chewing gum
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17. Chewing gum according to any of claims 1-16, wherein
said chewing gum comprises flavor in an amount of 0.2 to about 4 wt %, said
percentage being based on the total weight of the chewing gum

20 18. Chewing gum according to any of claims 1- 17, wherein
said flavor comprises water soluble ingredients.

19. Chewing gum according to any of claims 1-18, wherein
said water soluble flavor comprises acids.

25 20. Chewing gum according to any of claims 1-19, wherein
said flavor comprises water insoluble ingredients.

21. Chewing gum according to any of claims 1- 20, wherein
30 said chewing gum ingredients comprising sweeteners.

22. Chewing gum according to any of claims 1-21,

wherein said sweetener comprises bulk sweeteners

23. Chewing gum according to any of claims 1-22,
wherein the chewing gum comprises bulk sweeteners in the amount of about 5 to
5 about 95% by weight of the chewing gum, more typically about 20 to about 80% by
weight of the chewing gum.

24. Chewing gum according to any of claims 1-23, wherein said sweetener comprises
high intensity sweeteners

10 25. Chewing gum according to any of claims 1-24, wherein the high intensity
sweeteners comprises sucralose, aspartame, salts of acesulfame, alitame, saccharin
and its salts, cyclamic acid and its salts, glycyrrhizin, dihydrochalcones, thaumatin,
monellin, sterioside, alone or in combination

15 26. Chewing gum according to any of claims 1-25,
wherein the chewing gum comprises high intensity sweeteners in an amount of about
0 to about 1% by weight of the chewing gum, more typically about 0.05 to about 0.5
% by weight of the chewing gum.

20 27. Chewing gum according to any of claims 1- 26,
wherein the chewing gum comprises at least one softener.

28. Chewing gum according to any of claims 1- 27,
25 wherein the at least one softener comprises tallow, hydrogenated tallow,
hydrogenated and partially hydrogenated vegetable oils, cocoa butter, glycerol
monostearate, glycerol triacetate, lecithin, mono-, di- and triglycerides, acetylated
monoglycerides, fatty acids - such as stearic, palmitic, oleic and linoleic acids,
waxes, PGE and mixtures thereof.

30 29. Chewing gum according to any of claims 1- 28,

wherein the chewing gum comprises softeners in the amount of about 0 to about 18% by weight of the chewing gum, more typically about 0 to about 12 % by weight of the chewing gum.

- 5 30. Chewing gum according to any of claims 1- 29, wherein said chewing gum ingredients comprise active ingredients.
31. Chewing gum according to any of claims 1- 30, said active ingredients being selected from the group of: Acetaminophen, Acetylsalicylsyre Buprenorphine
- 10 Bromhexin Celcoxib Codeine, Diphenhydramin, Diclofenac, Etoricoxib, Ibuprofen, Indometacin, Ketoprofen, Lumiracoxib, Morphine, Naproxen, Oxycodon, Parecoxib, Piroxicam, Pseudoefedrin, Rofecoxib, Tenoxicam, Tramadol, Valdecoxib, Calciumcarbonat, Magaldrate, Disulfiram, Bupropion, Nicotine, Azithromycin, Clarithromycin, Clotrimazole, Erythromycin, Tetracycline, Granisetron,
- 15 Ondansetron, Prometazin, Tropisetron, Brompheniramine, Ceterizin, Ieco-Ceterizin, Chlorcyclizine, Chlorpheniramin, Chlorpheniramin, Difenhydramine, Doxylamine, Fenofenadin, Guaifenesin, Loratidin, des-Loratidin, Phenyltoloxamine, Promethazin, Pyridamine, Terfenadin, Troxerutin, Methylldopa, Methylphenidate, Benzalcon. Chloride, Benzeth: Chloride, Cetylpyrid. Chloride, Chlorhexidine, Ecabet-sodium,
- 20 Haloperidol, Allopurinol, Colchinine, Theophylline, Propanolol, Prednisolone, Prednisone, Fluoride, Urea, Miconazole, Actot, Glibenclamide, Glipizide, Metformin, Miglitol, Repaglinide, Rosiglitazone, Apomorfin, Cialis, Sildenafil, Vardenafil, Diphenoxylate, Simethicone, Cimetidine, Famotidine, Ranitidine, Ratinidine, cetrizin, Loratadine, Aspirin, Benzocaine, Dextrometorphan, Ephedrine,
- 25 Phenylpropanolamine, Pseudoephedrine, Cisapride, Domperidone, Metoclopramide, Acyclovir, Dioctylsulfosucc., Phenolphthalein, Almotriptan, Eletriptan, Ergotamine, Migea, Naratriptan, Rizatriptan, Sumatriptan, Zolmitriptan, Aluminium salts, Calcium salts, Ferro salts, Silver salts, Zinc-salte, Amphotericin B, Chlorhexidine, Miconazole, Triamcinolonacetonid, Melatonine, Phenobarbitol, Caffeine,
- 30 Benzodiazepiner, Hydroxyzine, Meprobamate, Phenothiazine, Buclizine, Brometazine, Cinnarizine, Cyclizine, Difenhydramine, Dimenhydrinate, Buflomedil, Amphetamine, Caffeine, Ephedrine, Orlistat, Phenylephedrine, Phenylpropanolamin,

Pseudoephedrine, Sibutramin, Ketoconazole, Nitroglycerin, Nystatin, Progesterone, Testosterone, Vitamin B12, Vitamin C, Vitamin A, Vitamin D, Vitamin E, Pilocarpin, Aluminiumaminoacetat, Cimetidine, Esomeprazole, Famotidine, Lansoprazole, Magnesiumoxide, Nizatide and/or Ratinidine or derivates and mixtures thereof.

5 32. Chewing gum according to any of claims 1-31, wherein the chewing gum is substantially free of non-biodegradable polymers

10 33. Chewing gum according to any of claims 1-32, wherein the at least two or more cyclic esters are selected from the groups of glycolides, lactides, lactones, cyclic carbonates or mixtures thereof.

15 34. Chewing gum according to any of claims 1-33, wherein lactone monomers are chosen from the group of ϵ -caprolactone, δ -valerolactone, γ -butyrolactone, and β -propiolactone. It also includes ϵ -caprolactones, δ -valerolactones, γ -butyrolactones, or β -propiolactones that have been substituted with one or more alkyl or aryl substituents at any non-carbonyl carbon atoms along the ring, including compounds in which two substituents are contained on the same carbon atom.

20 35. Chewing gum according to any of claims 1-34, wherein the carbonate monomer is selected from the group of trimethylene carbonate, 5-alkyl-1,3-dioxan-2-one, 5,5-dialkyl-1,3-dioxan-2-one, or 5-alkyl-5-alkyloxycarbonyl-1,3-dioxan-2-one, ethylene carbonate, 3-ethyl-3-hydroxymethyl, propylene carbonate, trimethylolpropane monocarbonate, 4, 6dimethyl-1, 3-propylene carbonate, 2, 2-dimethyl trimethylene carbonate, and 1, 3-dioxepan-2-one and mixtures thereof.

25 36. Chewing gum according to any of claims 1- 35, wherein cyclic ester polymers and their copolymers resulting from the polymerization of cyclic ester monomers include, but are not limited to : poly (L-

lactide) ; poly (D-lactide) ; poly (D, L-lactide) ; poly (mesolactide) ; poly (glycolide) ; poly (trimethylenecarbonate) ; poly (epsilon-caprolactone) ; poly (L-lactide-co-D, L-lactide) ; poly (L-lactide-co-meso-lactide) ; poly (L-lactide co-glycolide) ; poly (L-lactide-co-trimethylenecarbonate) ; poly (L-lactide co-epsilon-caprolactone) ; poly (D, L-lactide-co-meso-lactide) ; poly (D, L-lactide-co-glycolide) ; poly (D, L-lactide-co-trimethylenecarbonate) ; poly (D, L-lactide-co-epsilon-caprolactone) ; poly (meso-lactide-co-glycolide) ; poly (meso-lactide-co-trimethylenecarbonate) ; poly (meso-lactide-co-epsilon-caprolactone) ; poly (glycolide-cotrimethylenecarbonate) ; poly (glycolide-co-epsilon-caprolactone).

37. Chewing gum according to any of claims 1-36,
wherein the chewing gum comprises filler.

15 38. Chewing gum according to any of claims 1-37,
wherein the chewing gum comprises filler in an amount of about 0 to about 50% by
weight of the chewing gum, more typically about 10 to about 40 % by weight of the
chewing gum.

20 39. Chewing gum according to any of claims 1-38,
wherein the chewing gum comprises at least one coloring agent.

40. Chewing gum according to any of claims 1-39, where the chewing gum is coated
with an outer coating.

25 41. Chewing gum according to any of claims 1-40, wherein the outer coating is a
hard coating.

42. Chewing gum according to any of claims 1-41, wherein the hard coating is a
30 coating selected from the group consisting of a sugar coating and a sugarless coating
and a combination thereof.

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43. Chewing gum according to any of claims 1-42, wherein the hard coating comprises 50 to 100% by weight of a polyol selected from the group consisting of sorbitol, maltitol, mannitol, xylitol, erythritol, lactitol and isomalt.

5 44. Chewing gum according to any of claims 1-43, wherein the outer coating is an edible film comprising at least one component selected from the group consisting of an edible film-forming agent and a wax.

10 45. Chewing gum according to any of claims 1-44, wherein the film-forming agent is selected from the group consisting of a cellulose derivative, a modified starch, a dextrin, gelatine, shellac, gum arabic, zein, a vegetable gum, a synthetic polymer and any combination thereof.

15 46. Chewing gum according to any of claims 1-45, wherein the outer coating comprises at least one additive component selected from the group consisting of a binding agent, a moisture absorbing component, a film forming agent, a dispersing agent, an antisticking component, a bulking agent, a flavouring agent, a colouring agent, a pharmaceutically or cosmetically active component, a lipid component, a wax component, a sugar, an acid and an agent capable of accelerating the after-20 chewing degradation of the degradable polymer.

47. Chewing gum according to any of claims 1-46, wherein the outer coating is a soft coating.

25 48. Chewing gum according to any of claims 1-47, wherein the soft coating comprises a sugar free coating agent.

49. Chewing gum according to any of claims 1-48,
wherein said chewing gum comprises conventional chewing gum polymers or resins.

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50. Chewing gum according to any of claims 1-49,

wherein the at least one biodegradable polymer comprises at least 5% of the chewing gum polymers.

51. Chewing gum according to any of claims 1-50,

5 wherein all the biodegradable polymers comprised in the chewing gum comprises at least 25%, preferably at least 50% of the chewing gum polymers.

52. Chewing gum according to any of claims 1-51,

10 wherein all the biodegradable polymers comprised in the chewing gum comprises at least 80%, preferably at least 90% of the chewing gum polymers.

53. Chewing gum according to any of claims 1-52,

wherein said chewing gum comprises

15 - said at least one biodegradable polyester copolymer forming a plasticizer of the chewing gum and
- at least one non-biodegradable conventional elastomer.

54. Chewing gum according to any of claims 1-53,

wherein said chewing gum comprises

20 - said at least one biodegradable polyester copolymer forming an elastomer of the chewing gum and
- at least one non-biodegradable conventional natural or synthetic resin.

25 55. Chewing gum according to any of the claims 1-54, wherein said chewing gum comprises

at least one biodegradable elastomer in the amount of about 0.5 to about 70% wt of the chewing gum,

30 at least one biodegradable plasticizer in the amount of about 0.5 to about 70% wt of the chewing gum and

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at least one chewing gum ingredient chosen from the groups of softeners, sweeteners, flavoring agents, active ingredients and fillers in the amount of about 2 to about 80% wt of the chewing gum.